

49. (NEW) A wellbore fluid as in Claim 36 wherein the synthetic hydrocarbons are selected from the group consisting of *n*-paraffins, alphaolefins, internal olefins, and polyalphaolefins; synthetic liquids such as dialkyl ethers, alkyl alkanoate esters, acetals; and the natural oils are selected from the group consisting of triglycerides, rape-seed oil, and sunflower oil.

50. (NEW) A wellbore fluid as in Claim 37, wherein the discontinuous liquid phase is water or a brine.

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51. (NEW) A wellbore fluid as in Claim 39, wherein the conductive polymers are polyaniline, polypyrrole, and organometallic phthalocyanines.

52. (NEW) A wellbore fluid as in Claim 41, wherein the functional wellbore fluid components are selected from the group consisting of clay, organoclay, polymeric viscosifiers, filtration reducers, weighting agents, or a lubricating additive.

Rule 1.126
53. (NEW) A wellbore fluid as in Claim 42, wherein the solids are clays or weighting materials.

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~~53.~~ (NEW) A wellbore fluid as in Claim 43, wherein the solids are clays or weighting materials.

REMARKS

Applicants have amended the claims to more clearly point out and distinctly claim the subject matter which the applicant regards as the invention. Applicants have amended the claims to remove the European claim language which included phrases like "such as," "and the like," and "selected from the class including". New dependent claims were added to accommodate the examples used after the "such as," "and the like," and "selected from the class including" phrases. Applicants, with these amendments, do not intend to limit the scope of the claims in any way, and have not added any new matter.

Claim 25 has been made into an independent claim by incorporating by reference under 35 USC § 112, fourth paragraph, the subject matter of claim 22.

Support for all of the amendments is located in the specification as filed.

IN RESPONSE TO THE OFFICE ACTION:**REJECTION UNDER 35 USC § 112:**

Claims 22-43, have been rejected under 35 USC § 112, second paragraph, as allegedly being indefinite. Applicants have amended the claims to remove the European claim language which included phrases like “such as,” “and the like,” and “selected from the class including”. Applicants, with these amendments, do not intend to limit the scope of the claims in any way, and have not added any new matter.

Additionally, the antecedent bases problems in claims 27 and 35 were corrected.

Claims 38, 39, and 40 now appear to be allowable as they were only rejected under 35 USC § 112.

In view of the above, Applicants respectfully request the reconsideration and withdrawal of the rejection of claims 22-43 under 35 USC §112 and ask that the Examiner indicate the allowance of these claims in the next paper from the Office.

FIRST REJECTION UNDER 35 USC § 102:

Claims 22-37, 41 and 42 have been rejected under 35 USC §102 as allegedly being anticipated by U.S. Patent No. 5,348,938 issued to Mueller et al. (the Mueller reference). In response, Applicants request that the Examiner reconsider and withdraw the rejection in view of the following:

1. Under US patent law the Courts have ruled that for there to be anticipation under 35 USC § 102, “each and every element” of the claimed invention must be found either expressly or inherently described in a single prior art reference. *Verdegaal Bros. Inc. v. Union Oil Co. of Cal.*, 814 F.2d 1565, 1571; 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1986) and references cited therein. See also *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 1571; 230 U.S.P.Q. 81, 84 (Fed. Cir. 1986) (“absence from the reference of any claimed element negates anticipation.”); *In re Schreiber*, 128 F.3d 1473, 1477; 44 U.S.P.Q.2d 1429, 1431 (Fed.Cir. 1997).
2. The present invention is directed to a water-in-oil emulsion type wellbore fluid which is useful for the electrical logging of a wellbore where the non-aqueous continuous phase

is conductive as is recited in the claims amended in this response.

3. In contrast, Mueller is directed to an invert drilling fluid which comprises an alcohol or an alcohol and ester. Mueller does not teach that the fluid is conductive, or is useful for the electrical logging of wells. Additionally, even if the fluids of Mueller have some conductivity, no parameters are given teaching the amount necessary to conduct electrical well logging. Therefore, Mueller does not disclose the electrical logging element, and thus does not anticipate claim 22 under 35 USC § 102 because “each and every element” as required in *Verdegaal* has not been disclosed. Thus, because dependent claims 23-37, 41 and 42 contain the elements of claim 22, they also are not anticipated by Mueller.

In view of the above, Applicants respectfully request the reconsideration and withdrawal of the rejection of claims 22-37, 41 and 42 under 35 USC §102 and ask that the Examiner indicate the allowance of these claims in the next paper from the Office.

SECOND REJECTION UNDER 35 USC § 102:

Claims 22, 25, 26, 28, 29, 31-34, 37, 41 and 42 have been rejected under 35 USC §102 as allegedly being anticipated by U.S. Patent No. 5,141,920 issued to Bland et al. (the Bland reference). In response, Applicants request that the Examiner reconsider and withdraw the rejection in view of the following:

1. In the interest of brevity, please refer to the discussion of anticipation under 35 USC § 102 in the prior section.
2. The present invention is directed to a water-in-oil emulsion type wellbore fluid which is useful for the electrical logging of a wellbore where the non-aqueous continuous phase is conductive as is recited in the claims amended in this response.
3. In contrast, the external (continuous) phase of the Bland fluids is essentially non-conductive because the salts are in the discontinuous phase. (See Col. 4, ll. 60-68.) Applicant’s independent claim 22 teaches that the continuous phase is conductive. Bland does not disclose this element, and thus does not anticipate claim 22 under 35 USC § 102 because “each and every element” as required in *Verdegaal* has not been disclosed. Thus, because dependent claims 25,

26, 28, 29, 31-34, 37, 41 and 42 contain the elements of claim 22, they also are not anticipated by Bland.

In view of the above, Applicants respectfully request the reconsideration and withdrawal of the rejection of claims 22, 25, 26, 28, 29, 31-34, 37, 41 and 42 under 35 USC §102 and ask that the Examiner indicate the allowance of these claims in the next paper from the Office.

Applicants hereby authorize the Commissioner to charge \$ 246.00 (1 new independent claim and 9 new dependent claims) to the Deposit Account No. 01-2508, referencing Order No. 11836.0689.PCUS00. Applicants' representative hereby authorizes the Commissioner to charge any additional fees which may be required, or credit any overpayment, to the Deposit Account No. 01-2508, referencing Order No. 11836.0689.PCUS00.

Applicants hereby petition for any extension of time that may be deemed necessary to further the prosecution of this application. Applicants' representative hereby authorizes the Commissioner to charge any additional fees which may be required, or credit any overpayment, to the Deposit Account No. 01-2508, referencing Order No. 11836.0689.PCUS00.

In order to facilitate the resolution of any issues or questions presented by this paper, Applicants respectfully request that the Examiner directly contact the undersigned by phone to further the discussion, reconsideration and allowance of the claims.

In order to promote the prosecution of this application, the Examiner is hereby authorized to contact the undersigned by electronic mail. Please address all e-mail to: whitec@howrey.com.

Respectfully submitted,



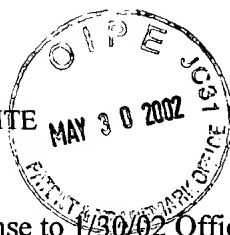
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Date: 30 May 02



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CLAIMS

22. (Amended) A wellbore fluid of the water-in-oil emulsion type useful for electrical well-logging comprising a discontinuous aqueous or brine phase, solids, ~~such as clays or weighting material~~ and having a non-aqueous continuous liquid phase that comprises a polar organic liquid POL which exhibits a dielectric constant of at least about 5.0 and a Hildebrand Solubility Parameter of at least about $17 (\text{J cm}^{-3})^{1/2}$ so that the liquid phase exhibits an electrical conductivity of not less than $10 \mu\text{S m}^{-1}$ at 1 kHz.

23. A wellbore fluid as in claim 22, wherein the non-aqueous liquid phase further comprises a water immiscible organic liquid OL.

24. A wellbore fluid as in claim 23, wherein the non-aqueous liquid phase is comprised of 1 to 99% by volume of POL + 99 to 1% by volume OL, and more preferably of 5 to 95% by volume of POL and 95 to 5% by volume of OL.

25. (Amended) ~~A wellbore fluid as in claim 22~~ A wellbore fluid of the water-in-oil emulsion type comprising a discontinuous aqueous or brine phase, solids, a water immiscible organic liquid OL, and having a non-aqueous continuous liquid phase that comprises a polar organic liquid POL which exhibits a dielectric constant of at least about 5.0 and a Hildebrand Solubility Parameter of at least about $17 (\text{J cm}^{-3})^{1/2}$ so that the liquid phase exhibits an electrical conductivity of not less than $10 \mu\text{S m}^{-1}$ at 1 kHz, wherein the non-aqueous liquid phase further comprises a dissolved component (DC) selected from: water; inorganic salts wherein the anion(s) is (are) a conjugate base of an acid whose dissociation constant (pK_a) in water at 298 °K is less than about 1.0, and the cation is ammonium ion or a metal ion which has an ionic radius of less than about 2/3 of the ionic radius of the pre-selected anion; quaternary ammonium salts or hydroxides; N-alkyl pyridinium salts or hydroxides; and organic bases exhibiting a pK_a in water at 298 °K of more than 10.0, and their salts.

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26. A wellbore fluid as in claim 25, wherein the non-aqueous liquid phase comprises of about 0.1 % to about 50% by volume of the dissolved component DC.

27. A wellbore fluid as in claim 26, wherein the non-aqueous liquid phase comprises 1 to 98.5% by volume POL , 1 to 98.5% by volume OL and 0.5 to 50% by volume DC.

28. (Amended) A wellbore fluid as in claim ~~22-25~~ wherein the polar organic liquid POL is one or more selected from the ~~class including group consisting of~~ alcohols, phenols, glycols, polyalkylene glycols, mono (alkyl or mono aryl) ethers of glycols, mono (alkyl or mono aryl) ethers of polyalkylene glycols, monoalkanoate esters of glycols, monoalkanoate esters of polyalkylene glycols, ketones possessing also hydroxyl group(s), diketones.

29. (Amended) A wellbore fluid as in claim ~~22-25~~, wherein the polar organic liquid POL component is selected from the ~~class including group consisting of~~:

- aliphatic and alicyclic alcohols of carbon numbers C₅-C₁₀ ~~such as *n*-pentanol, cyclohexanol, *n*-octanol, 2-ethylhexanol, and *n*-decanol;~~
- phenols ~~such as ortho-, meta-, or para-cresol;~~
- glycols ~~such as 1,3-butane diol, 1,4-butane diol, 2-ethylhexane 1,3-diol;~~
- polyalkylene glycols ~~such as polypropylene glycols of molecular weight above about 1000, polybutylene glycols, polytetrahydrofuran, polyalkylene glycols or copolymers of ethylene oxide and/or propylene oxide and/or butylene oxide initiated by any hydroxylic or amino functional moiety wherein the polyalkylene glycol or copolymer is further characterised by exhibiting a cloud point (at 1% concentration in water) of less than about 10 °C;~~
- mono-alkyl or mono-aryl ethers of glycols or polyalkylene glycols ~~such as ethylene glycol monobutyl ether, diethylene glycol monobutyl ether, dipropylene glycol monomethyl ether, tripropylene glycol monomethyl ether, propylene glycol~~

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~~monobutyl ether, dipropylene glycol monobutyl ether, tripropylene glycol monobutyl ether, propylene glycol phenyl ether, dipropylene glycol phenyl ether;~~

- diacetone alcohol (4-hydroxy-4-methyl-1,2-pentanone); acetylacetone; acetonylacetone.

30. (Amended) A wellbore fluid as in claim ~~22~~25, wherein the polar organic liquid POL is an aprotic solvent.

31. (Amended) A wellbore fluid as in claim 25 wherein the inorganic salt comprises anions which are the conjugate base of an acid selected from the ~~class including group~~ consisting of hydrochloric acid; hydrobromic acid; hydroiodic acid; thiocyanic acid; perchloric acid; nitric acid; permanganic acid; sulphuric acid; alkane sulphonic acids ~~such as methane sulphonic acid and ethane sulphonic acid;~~ arene sulphonic acids ~~such as benzene sulphonic acid and naphthalene sulphonic acid;~~ alkylaryl sulphonic acid ~~such as toluene sulphonic acid;~~ alkane and arene sulphonic acids substituted with electron-withdrawing groups ~~such as trifluoromethane sulphonic acid and 2,4-dinitrobenzene sulphonic acid; picric acid and trichloroacetic acid.~~

32. A wellbore fluid as in Claim 25 wherein the quaternary ammonium salts or hydroxides are the chlorides, bromides, iodides, methosulphates, ethosulphates or hydroxides of quaternary ammonium cations having alkyl and/or aryl and/or alkylaryl groups such that the total number of carbon atoms in all the groups combined with the nitrogen atom is in the range 8 to 60, and more preferably in the range 12 to 40.

33. (Amended) A wellbore fluid as in Claim 25 wherein the organic base(s) exhibiting a pK_a in water of more than 10.0 is selected from the ~~class including group~~ consisting of mono-, di-, and tri-alkylamines wherein the alkyl groups contain from 2 to 18 carbon atoms; alkylpiperidines; alkylpyrrolidines; N-alkylated ethyleneamines; and their salts.

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34. (Amended) A wellbore fluid of the water-in-oil emulsion type comprising a discontinuous aqueous or brine phase, solids ~~such as clays or weighting material and~~ having a non-aqueous continuous liquid phase that comprises that comprises from about 99.5% to about 50% by volume of a water immiscible organic liquid OL and about 0.5% to about 50% by volume of a dissolved component (DC) selected from: water; inorganic salts wherein the anion(s) is (are) a conjugate base of an acid whose dissociation constant (pK_a) in water at 298 °K is less than about 1.0, and the cation is ammonium ion or a metal ion which has an ionic radius of less than about 2/3 of the ionic radius of the pre-selected anion; quaternary ammonium salts or hydroxides; N-alkyl pyridinium salts or hydroxides; and organic bases exhibiting a pK_a in water at 298 °K of more than 10.0, and their salts, said continuous liquid phase exhibiting an electrical conductivity of not less than $10 \mu S m^{-1}$ at 1 kHz.

35. (Amended) A wellbore fluid as in claim ~~2225~~, wherein the water immiscible organic liquid OL is one, or a mixture of two or more, liquid(s) selected from the class ~~including~~ group consisting of crude oil; hydrocarbon fractions refined from crude oil; synthetic hydrocarbons ~~such as n-paraffins, alphaolefins, internal olefins, and polyalphaolefins;~~ synthetic liquids ~~such as dialkyl ethers, alkyl alkanoate esters, acetals;~~ and natural oils ~~such as triglycerides including rape seed oil, sunflower oil and the like.~~

36. (Amended) A wellbore fluid as in claim 34, wherein the water immiscible organic liquid OL is one, or a mixture of two or more, liquid(s) selected from the class ~~including~~ group consisting of crude oil; hydrocarbon fractions refined from crude oil; synthetic hydrocarbons ~~such as n-paraffins, alphaolefins, internal olefins, and polyalphaolefins;~~ synthetic liquids ~~such as dialkyl ethers, alkyl alkanoate esters, acetals;~~ and natural oils ~~such as triglycerides including rape seed oil, sunflower oil and the like.~~

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37. (Amended) A wellbore fluid as in claim ~~22-25~~ wherein a discontinuous liquid phase ~~such as water or a brine~~ is added together with one or more emulsifier to form a water-in-organic-liquid emulsion wherein the discontinuous phase is present at up to 70% by volume of the emulsion.

38. (Amended) A wellbore fluid as in claim ~~22-25~~ wherein it further comprises a dispersion in the wellbore fluid of finely divided particles of an electrically conducting solid insoluble in the organic liquid or water.

39. (Amended) A wellbore fluid as in Claim 38 wherein the finely divided electrically conducting solid is selected from the ~~class including group consisting of~~ metals; carbon preferably in the form of graphite or carbon fibre; metal coated carbon fibre or graphite; and ~~conductive polymers such as polyaniline, polypyrrole, organometallic phthalocyanines and the like.~~

40. A wellbore fluid as in Claim 39 wherein the finely divided conducting solid is in the form of high aspect ratio fibres, flakes or platelets.

41. (Amended) A wellbore fluid as in claim ~~22-25~~ further comprising a functional wellbore fluid components ~~such as clay, organoclay or polymeric viscosifiers; filtration reducers, weighting agents or a lubricating additive.~~

42. (Amended) A method of drilling or completing a well wherein the used wellbore fluid is of the water-in-oil emulsion type useful for electrical well-logging comprising a discontinuous aqueous or brine phase, solids ~~such as clays or weighting material~~, and having a non-aqueous continuous liquid phase that comprises a polar organic liquid POL which exhibits a dielectric constant of at least about 5.0 and a Hildebrand Solubility Parameter of at least about 17 (J cm⁻³)^{1/2} so that the liquid phase exhibits an electrical conductivity of not less than 10 µS m⁻¹ at 1 kHz.

43. (Amended) A method of providing enhanced information from electrical logging tools, measurement while drilling, logging while drilling, and geosteering ~~and the like~~

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wherein the efficiency is enhanced by the improved electrical conductivity of a of the water-in-oil emulsion type comprising a discontinuous aqueous or brine phase, solids ~~such as clays or weighting material~~ and having a non-aqueous continuous liquid phase that comprises a polar organic liquid POL which exhibits a dielectric constant of at least about 5.0 and a Hildebrand Solubility Parameter of at least about $17 \text{ (J cm}^{-3})^{1/2}$ so that the liquid phase exhibits an electrical conductivity of not less than $10 \mu\text{S m}^{-1}$ at 1 kHz.

44. (NEW) A wellbore fluid as in claim 22 wherein the solids are clays or weighting materials.

45. (NEW) A wellbore fluid as in claim 29, wherein the aliphatic and alicyclic alcohols are selected from the group consisting of *n*-pentanol, cyclohexanol, *n*-octanol, 2-ethylhexanol, and *n*-decanol; the phenols are selected from the group consisting of ortho, meta, or para cresol; the polyalkylene glycols are selected from the group consisting of polypropylene glycols of molecular weight above about 1000, polybutylene glycols, polytetrahydrofuran, polyalkylene glycols or copolymers of ethylene oxide and/or propylene oxide and/or butylene oxide initiated by any hydroxylic or amino-functional moiety wherein the polyalkylene glycol or copolymer is further characterised by exhibiting a cloud point (at 1% concentration in water) of less than about 10 °C; the mono-alkyl or mono-aryl ethers of alcohols or polyalkylene glycols are selected from the group consisting of ethylene glycol monobutyl ether, diethylene glycol monobutyl ether, dipropylene glycol monomethyl ether, tripropylene glycol monomethyl ether, propylene glycol monobutyl ether, dipropylene glycol monobutyl ether, tripropylene glycol monobutyl ether, propylene glycol phenyl ether, dipropylene glycol phenyl ether.

46. (NEW) A wellbore fluid as in Claim 25, wherein the alkane sulphonic acids are selected from the group consisting of sulphonic acid and ethane sulphonic acid; the arene sulphonic acids are selected from the group consising of benzene sulphonic acid

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and naphthalene sulphonic acid; and the alkane and arene sulphonic acids substituted with electron-withdrawing groups are selected from the group consisting of trifluoromethane sulphonic acid and 2,4-dinitrobenzene sulphonic acid, picric acid, and trichloroacetic acid.

47. (NEW) A wellbore fluid as in Claim 34, wherein the solids are clays or weighting materials.

48. (NEW) A wellbore fluid as in Claim 35 wherein the synthetic hydrocarbons are selected from the group consisting of *n*-paraffins, alphaolefins, internal olefins, and polyalphaolefins; synthetic liquids such as dialkyl ethers, alkyl alkanoate esters, acetals; and the natural oils are selected from the group consisting of triglycerides, rape-seed oil, and sunflower oil.

49. (NEW) A wellbore fluid as in Claim 36 wherein the synthetic hydrocarbons are selected from the group consisting of *n*-paraffins, alphaolefins, internal olefins, and polyalphaolefins; synthetic liquids such as dialkyl ethers, alkyl alkanoate esters, acetals; and the natural oils are selected from the group consisting of triglycerides, rape-seed oil, and sunflower oil.

50. (NEW) A wellbore fluid as in Claim 37, wherein the discontinuous liquid phase is water or a brine.

51. (NEW) A wellbore fluid as in Claim 39, wherein the conductive polymers are polyaniline, polypyrrole, and organometallic phthalocyanines.

52. (NEW) A wellbore fluid as in Claim 41, wherein the functional wellbore fluid components are selected from the group consisting of clay, organoclay, polymeric viscosifiers, filtration reducers, weighting agents, or a lubricating additive.

53. (NEW) A wellbore fluid as in Claim 42, wherein the solids are clays or weighting materials.

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54. (NEW) A wellbore fluid as in Claim 43, wherein the solids are clays or weighting materials.